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**Evaluating Governance and Market of
Country Code Top Level Domain (ccTLD):
Lessons for Indonesia's ccTLD .id**

A Capstone Project Presented by

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To

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**in partial fulfillment of the
requirements for the degree of
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Abstract

Domain name in this term refers to the Internet Domain Name System (DNS), the hierarchical naming system of Internet Protocol (IP) resources. One of the Top Level Domains (TLDs) of this structure is the country code Top Level Domain (ccTLD), which identifies the location of each nation on the Internet, such as .fr, .us, .id.

Country code Top Level Domains (ccTLDs) are not just simple identifiers on the Internet but Internet entities that enable people and institutions to exist in virtual countries and space. Moreover, ccTLDs as one of the Internet's resources have become a business that fosters utilization of the Internet especially e-commerce.

The *Internet Corporation for Assigned Names and Numbers (ICANN)* has started to call on all countries to reform the management of ccTLD to strengthen the government involvement in the ccTLD management system. Accordingly, since 2008, the government of Indonesia has initiated regulatory reforms to manage the Country code Top Level Domain Indonesia (ccTLD .id)

There are two main concerns questioned in this research: **First, what is the model of governance for ccTLD. id? Second, what are the implications of the governance model to improve the market of ccTLD .id?**

This research will use comparative method by analyzing secondary data to compare the similarities and differences between four national ccTLD regime models based on multi stakeholder system represented by four ccTLDs, which are .ch (Switzerland), .au (Australia), .mx (Mexico), .ca (Canada). The Analysis of four national ccTLD regime models focuses on model of governance and market orientation of each ccTLD.

This capstone is intended to suggest the governance model to support globalized market of ccTLD. ID. Because of the low level of the Internet penetration and inequality of ICT infrastructures among regions in Indonesia, ccTLD.id market should not be limited at national market, and the Internet users should be allowed to have direct access to ccTLD .id. Moreover, this research will define what the implications of governance are, in order to improve the market of ccTLD .id.

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I. Introduction

1.1 Introduction to Domain Names and Country Code Top Level Domains

Domain name in this term is used as identification string, to refer to a name with structure indicated by dots, [and](#) also to represent an Internet Protocol (IP) resource. Domain name as consistent name space is well hierarchical structured and connected to the Internet, which is called ~~as~~ The Internet Domain Name System. Furthermore, The Domain Name System (DNS) facilitates the translation between hostnames and addresses. Within the Internet, this means translating from a name such as "venera.isi.edu", to an IP address such as "128.9.0.32". (Cooper & Postel, RFC 1480, 1993, p.2).

The hierarchical structure of DNS consists of the first-level set of domain names called the top-level domains (TLDs), below these top-level domains are the second-level and third-level domain names. Top Level Domains (TLDs) consist of Country Code Top Level Domain (ccTLD), and Generic Top Level Domain (gTLD). Country code Top Level domain (ccTLD) is the identity of each nation on the Internet, such as .fr, .us, .id. While Generic Top Level Domain (gTLD) represents a set of categories of names and multi-organizations, such as .com, .org, .edu.

Country Code Top Level Domains (ccTLDs) are referred to as virtual countries in order to emphasize the nature of the ccTLD space. The concept of virtual countries on the Internet was first discussed by a small group of engineers under the leadership of Jon Postel in

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1978 (Cohen,1978)¹. Postel and his group decided to adopt the ISO 3166-1 list for their list of virtual countries so that they could avoid political decisions regarding whether parties who wanted to create virtual countries for their own countries had legitimate requests. In principle, the ISO 3166-1 list is based on the United Nations Statistics Division's list. The UN list consists of codes given in the UN Bulletin "Country Names" and in the code list of the "Standard Country or Area Codes for Statistical Use." (Park, Youn, 2008, p. 7).

The value of domain names, especially ccTLDs, depend on simplicity to be remembered, the accountability of company with a trustworthy Internet infrastructures, and the positive of brand image or domain name's quality. Also, it is a model of organizing virtual territories to govern the issues relate with visibility, transparency, and property effect of online websites, which have commercial and non-commercial [contents](#).

Country code Top Level Domains (ccTLDs) are not just simple identifiers on the Internet but Internet entities that enable people and institutions to exist in virtual countries. Thus, ccTLDs should be seen as one of kinds of infrastructure in mind. Moreover, ccTLDs as one of the Internet's resources have become a business that fosters utilization of the Internet especially e-commerce. Moreover, some countries have started to open a market for ccTLD, not only aligning with second Top Level Domain (sTLD), but also opening registration for domain name registration under ccTLD, for example, to use ccTLD .id directly after the web name, www.dwielfrida.id, instead of www.dwielfrida.com.id. Thus, ccTLDs operators not only compete with generic Top Level Domains (gTLDs) operators, but also compete with other ccTLD operators to attract more citizens under their own

¹ Internet Experiment Notes (IEN) 31 in 1978 apud Youn Jung Park, Delegation Process of Virtual Countries: From Non-State Actors To State Actors, The Korean Journal of Policy Studies, 2008, Vol. 22, No. 2, 25-59, accepted February 2008.

territories.

1.2 Current condition and Objective

The Governmental Advisory Committee (GAC) has endorsed the authority to the government to manage or supervise their ccTLD². Thus, the Internet Corporation for Assigned Names and Numbers (ICANN) has started to call on all countries to reform the management of ccTLD for those who haven't already managed the ccTLD of their countries, and also for those countries that haven't involved the government in the ccTLD management.

Reviewing the current pattern of management of ccTLD .id, the ICANN notes that Mr. Budi Rahardjo and Mr.Santoso are registered as the administrative and technical contacts, and PPAU Mikroelektronika is sponsoring organization of .id. However, the fact is that these persons and this organization do not involve anymore in management ccTLD.id.

² GAC Principles and Guidelines for the Delegation and Administration of Country Code Top Level Domains:

Articles 1.6. It is recalled that the Governmental Advisory Committee (GAC) to ICANN has previously adopted the general principle that the Internet naming system is a public resource in the sense that its functions must be administered in the public or common interest. The WSIS Declaration of December 2003 states that **"policy authority for Internet-related public policy issues is the sovereign right of States. They have rights and responsibilities for international Internet-related public policy issues."** This is in the context that, "Governments, as well as private sector, civil society and the United Nations and other international organizations have an important role and responsibility in the development of the Information Society and, as appropriate, in decision-making processes. **Building a people-centered Information Society is a joint effort which requires cooperation and partnership among all stakeholders.**"

Articles 1.7. It is recalled that the WSIS Plan of action of December 2003 invites **"Governments to manage or supervise, as appropriate, their respective country code top-level domain name"**. Any such involvement should be based on appropriate national laws and policies. It is recommended that governments should work with their local Internet community in deciding on how to work with the ccTLD Registry."

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On June 29, 2007, a non-profit organization, PANDI (Pengelola Nama Domain Internet Indonesia), was formed. And the Ministry of Communication and Information Technology delegates the authority to PANDI to manage second level domain (2LD) co.id, net.id, or.id, ac.id, sch.id, web.id, net.id, mil.id, biz.id, my.id. Delegation of authority was written in memo Number 343 /DJAT/KOMINFO/6/2007, and signed by Directorate General of Telematic Application. However, PANDI has not registered at the ICANN as the registry of .id, and PANDI has not legitimated yet by the government of Indonesia as the registry of .id because memo signed by Director General of Telematic Application cannot be counted as regulation to give legitimacy to PANDI as registry of .id. Designation of registry and registrars has to be legitimated by the Minister's regulation. Moreover, the registrants have not been allowed to have direct access to ccTLD.id, and the ccTLD .id market is still limited at national market.

According to the Law of Republic of Indonesia No. 11 of 2008 concerning Electronic Information and Electronic Transaction, Article 24 point 1 states that the Administration for domain name is the government and/or the society. This regulation reflects that management of domain names is under government supervision and approval, including participation from the Internet society. It shows the initiative of the government of Indonesia to apply multi-stakeholders system in domain name management. In addition, the government regulation Number 82 in 2012, chapter VIII, about domain name management has been endorsed, the authority to manage registration process of second level domain (2LD) has been delegated to twelve (12) registrars who are Internet Service Providers (ISPs) based on private companies. The regime of ccTLD .id market categorized as "More State Controlled Multi-Stakeholder, National ccTLD Markets" seems not work

very well, because to date the numbers of registered names under 2LD; co.id, net.id, or.id, ac.id, sch.id, web.id, net.id, mil.id, biz.id, my.id, are still very low, which is 108, 979 names. This capstone will be intended to suggest the governance model to support globalized market of ccTLD. ID. And to define what the implications of governance are to improve the market of ccTLD .id.

1.3 Conceptual Research Model on ccTLDs

1.3.1 Research Question

There are two main concerns questioned in this research: First, what is the model of governance for ccTLD. ID? Second, what are the implications of the governance model to improve the market of ccTLD .id?. This research will use comparative method by analyzing secondary data to compare the differences between four national ccTLD regime models based on multi stakeholder system, which are:

1. More State Controlled Multi-Stakeholder, Global ccTLD Markets, represented by .ch, (ccTLD of Switzerland).
2. More State Controlled Multi-Stakeholder, National ccTLD Markets, represented by .au (ccTLD of Australia).
3. Less State Controlled Multi-Stakeholder Global ccTLD Markets, represented by .mx (ccTLD of Mexico)
4. Less State Controlled Multi-Stakeholder National ccTLD Markets, represented by .ca (ccTLD of Canada).

The analysis of four national ccTLD regime models; .ch, .au, .mx, .ca will be limited to these following questions:

- a. What are the roles of the government in the ccTLD management?
- b. What are the roles of the non-profit organization in the ccTLD management?
- c. What are the roles of private sector in the ccTLD management?
- d. How is the readiness of the Internet community to respond to ccTLD market? (the readiness of the Internet community will be seen from the rate of Internet

penetration and the number of registrants of ccTLD)

The answers of those questions are important to be considered in order to define whether or not in managing ccTLD .id, Indonesia will apply model:

1. Non-State Actor that applies multistakeholder and open ccTLD .id to global market, or the non-state actor that applies multistakeholder, but does not comply with the globalization of ccTLDs .id, because it is seen as national resources to support national sovereignty.
2. State Actor that applies multistakeholder and open ccTLD .id to global market, or the state actor that applies multistakeholder, and comply with the globalization of ccTLDs .id.

II. Literature review

2.1 Literature on Internet Governance

The World on the Information Society (WSIS) defined Internet governance as development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision making procedures, and program that shape the evaluation and use of the Internet³. Furthermore, the Internet Governance has some concerns to be implemented⁴. First, participation could be either direct or through legitimate intermediate institutions or representatives that are informed and organized. Second, the existence of rule of law is as fair legal frameworks that are enforced impartially. Third, transparency means that decisions taken and their enforcement are done in a manner that follows rules and regulations. Fourth, responsiveness means the institutions and processes try to serve all stakeholders within a reasonable timeframe. Fifth, consensus oriented to mediate the different interests in society to reach a broad consensus in society on what is in the best interest of the whole community and how this can be achieved. Sixth, equity and inclusiveness are to ensure that all its members feel that they

³ Kurbalija, Jovan, An Introduction to Internet Governance 4th Edition, DiploFoundation, Malta, 2010

⁴ What is Good Governance, ESCAP-United Nation available at <http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp>

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have a stake in it and do not feel excluded from the mainstream of society. Seventh, Effectiveness and efficiency of results meet the needs of society while making the best use of resources at their disposal. Eighth, accountability means that all parties involved in the process are accountable to the public and to their institutional stakeholders.

2.2 Literature on multi stakeholder system

Multi-stakeholder system, which is known as multistakeholderism is intended to gather participation from various parties who represent existing multidisciplinary such as information technology, human rights, trade, intellectual property, to work together to form policies for managing Internet usage. Multistakeholderism facilitates instant communication among state actors and non-state actors to bring the problems and initiatives that exist at national level and forward [them](#) to regional level, then make [them](#) an international obligation. Moreover, multi-stakeholder participations have raised unforeseen policy areas such as multilingualism, and ICT usage for disabilities community.

2.3 Literature on Country Code Top Level Domains

The country code top-level domains refer to virtual countries found by John Postel and his small group in 1978. The creation of virtual countries [was](#) executed by Jon Postel in conjunction with research projects starting in 1985. Postel and his group decided to adopt the ISO 3166-1 list for their list of virtual countries to avoid political decisions [and because](#) it is known to be very stable. [with](#) changes are made only when necessarys. The ISO 3166-1 list is based on the United Nations Statistics Division's list. The UN list consists of codes given in the UN Bulletin "Country Names" and in the code list of the "Standard Country or Area Codes for Statistical Use."

Regarding the actors [who](#) play the roles in maintaining virtual countries, since 1985 the

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virtual countries were managed by non-state actors. Then, from 1998 to 2007, there [have been](#) 250 virtual countries [as](#) delegates to state actor as part of resources of real countries and [to](#) represent the territories of countries (Park, Youn, 2008, p.35). Country code is not associated with territorial size, thus every virtual country should be treated equally, and territorial politics should not be applied into non-territorial virtual country politics.

Furthermore, ccTLDs as virtual countries also relate with the global political economy when it is open to all people in the world, likewise generic top-level domains (gTLDs) such as .com,.org. Some virtual countries have been opened to global market such as .mx, .uk, .au for reasons to explore virtual country as a global space and become the global transaction. Meanwhile the U.S. [has](#) closed their virtual country to people or entities under their jurisdiction for reasons that ccTLD .us, is the string of the name of real country that represent the sovereignty of country, also cyber security awareness is another concern to limit the usage of cold .us. However, closing virtual country to the global space [doesn't](#) [promise](#) security of national cyber space, because cyber attacks can come from another electronic communication and transaction such as virus computers, hacking IP address.

Nowadays more countries [are](#) aware of ccTLDs as component of their sovereignty and vital national interest, [and](#) as a platform for national economic growth. [However,](#) the state actors and non-state actors in the country do not manage their ccTLD by themselves, but delegate it to non-state actors [existing](#) in another countries, such as Tuvalu that has delegated the ccTLD .TV to Verisign company, and known as trademark of domain name for online television.

III. Methods

3.1 Introduction on Comparative Methodology

This research will use comparative case study analysis to examine the similarities and differences of four national ccTLD regime models based on [the](#) multistakeholder system. The models are based on three factors: [_](#)control of state, market orientation, and multistakeholder system. Moreover, this research use case-oriented strategies to understand or interpret specific cases because of intrinsic value exist in each national ccTLD regime model. The different models will help researcher to see the differences of ccTLD business models as outcomes.

The cases study examined in this research is national ccTLD regime models that have existed in four different countries, which are Switzerland, Australia, Mexico, and Canada. The reasons to choose these countries are; first, each country has different national ccTLD regime models. The emphasis of this comparative research is on diversity of national ccTLD regime models, and familiarity with ccTLD business. Since four different national ccTLD regime models do not exist among countries in Asia, and South East Asia, so the countries are not chosen based on territory. Second, the link to connect those countries is their membership in OECD (the Organization for Economic Co-operation and Development), an organization commit to help governments, foster prosperity and fight poverty through economic growth and financial stability. In 2012 at the Ministerial Council Meeting, the OECD launched the enhanced engagement with five key countries, including Indonesia.

This research will compare the similarities and differences across four national ccTLD regime models. The criteria of these models are control of state, market orientation, and multi-stakeholder system as shown in the table below: [_](#)

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Criteria of Comparison; Control of state, and Multi-stakeholder system	Criteria of Comparison; Market Orientation			
	Global Market		National Market	
More State Control & Multi-Stakeholder	More State Controlled Multi-Stakeholder, Global ccTLD Markets (.ch) (ccTLD of Switzerland)		More State Controlled Multi-Stakeholder, National ccTLD Markets (.au) (ccTLD of Australia)	
Less State Control & Multi-Stakeholder	Less State Controlled Multi-Stakeholder Global ccTLD Markets (.mx) (ccTLD of Mexico)		Less State Controlled Multi-Stakeholder National ccTLD Markets (.ca) (ccTLD of Canada)	

This comparative research will start with specified category of four national ccTLD regime models, then, continue with the analytic frames by analyzing the similarities and differences among four business model of ccTLD that have been build based on four national ccTLD regime models.

3.2 Data Collection and Analysis

This research will use secondary data which are:

- a. Database of companies as registry of ccTLD, which are:
 - SWITCH is registry of the ccTLD of Switzerland (.ch); at www.nic.ch.
 - AUREGISTRY is registry of the ccTLD of Australia (.au); www.auregistry.com.au
 - NIC MEXICO is registry of the ccTLD of Mexico (.mx); www.registry.mx
 - CIRA is registry of the ccTLD of Canada (.ca); www.cira.ca

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- b. OECD report
- c. Government regulations relate with domain name management.

3.3 Operational Definitions

There are some concerns as to base concepts used to define four national ccTLD regime models. The first concept is that of the ccTLD actors and GAC actors. The ccTLD refers to administrative and technical contacts. The administrative contact, or ccTLD manager, has decision-making power, while the technical contact is responsible for all technical issues of ccTLD operation. The GAC refers to government officials who attend meetings of the Governmental Advisory Committee of ICANN as the formal delegation of each country. Membership in the GAC is also open to distinct economies, recognized at international level, and multinational governmental organizations and treaty organizations, on the invitation of the Governmental Advisory Committee through its Chair⁵.

The second concept is market orientation based on market segmentation⁶. The two market orientations of ccTLDs are the global market and national market. The global ccTLD market refers to open market of ccTLD to all registrants globally, whereas the national ccTLD market refers to open ccTLDs at the national level only.

The third concept is state control. State control refers to the degree of the government's authority to regulate the ccTLD, since the ccTLD is seen as critical national infrastructure. The government authority over ccTLDs regulations varies among countries. Some governments only appoint an organization to manage ccTLD. For example, the Australian government endorsed auDA, a non-profit organization, to manage ccTLD .au, and

⁵ ICANN Bylaws Article XI, Section 2 Specific Advisory Committees b.

⁶ Market segmentation is marketing strategy to divide a broad target market into subsets of consumers who have common needs.

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delegated authority to form policies relate to ccTLD management to the auDA. Meanwhile, the government of Switzerland appointed SWITCH as the registry of .ch, but all regulations relate to ccTLD .ch made by the government on behalf of the Federal Office of Communications. ~~-(OFCOM).???~~

The fourth concept is multi-stakeholders, or the involvement of state actors (GAC actors) and ccTLD actors (private, non-profit organizations) to administer the ccTLDs as effort to comply with the ICANN regime's norms. Multi-stakeholders involve diverse roles of each party in ccTLD management, for example, the government as regulator, the non-profit organization as registry⁷, and the private organization as registrar⁸, but all contribute actively in governing ccTLD.

3.4 Definition of four national ccTLD regime models

3.4.1 More State Controlled Multi-Stakeholder, Global ccTLD Markets

Participation of ccTLD actors in the ICANN has developed a global market orientation, an open market of ccTLD globally. At the same time, when the participation of government, or GAC actors, is irregularly in the ICANN, it develops more state control of ccTLD. Multi-stakeholders reflect the participation of private or non-profit organization ~~than?~~ and ~~the~~ government to manage ccTLD. This would result in a global market and more state-controlled national ccTLD regime model.?

3.4.2 More State Controlled Multi-Stakeholder, National ccTLD Markets

⁷ **Registry** means the database administered by a Registry Operator, consisting of the zone file for a domain, containing the name and corresponding Domain Name System Resource Records, for each sub-domain of the domain. (Refer to IANA RFC 1034 for technical definitions.)

Registry Operator means a Legal Person who has been accredited or licensed to maintain a Registry and or to provide registry services in relation to the Registry.

⁸ **Registrar** means a legal person who acts as an interface between domain name holders (registrants) and a registry, providing registration services.

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Passive participation of ccTLD actors in the ICANN has resulted in national market behavior². Irregular participation of government (GAC actors) in the ICANN will develop more state control of ccTLD. Passive participation of ccTLD actors and GAC actors has caused less interaction among actors across countries to learn about innovation in domain name business. Thus, ccTLD actors tend to limit market at the national level, and GAC actors tend to have more authorities over ccTLD management because they don't look up to other countries system where the government delegates the authorities to manage ccTLD to multi-stakeholders. This will result in a national market and more state controlled national ccTLD regime model.

3.4.3 Less State Controlled Multi-Stakeholder Global ccTLD Markets

Active participation of ccTLD actors and regularly participation of government (GAC actors) in the ICANN will result in a global market and less state controlled national ccTLD regime model.

3.4.4 Less State Controlled Multi-Stakeholder National ccTLD Markets

Passive participation of ccTLD actors and regularly participation of the government (GAC actors) will result in a national market and less state controlled national ccTLD regime model.

3.5 Analytical Consideration

This study will analyze four national ccTLD regime models; .ch (Switzerland), .au (Australia), .mx (Mexico), .ca (Canada) that represent the virtual countries. It means that the aspects such as political, economic, social exist in the real countries are not analyzed

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and considered as part of pattern of business model of ccTLDs. However, this analysis is still relevant to be used as references to define national ccTLD regime model for Indonesia, because this analysis focuses to analyze model of governance in order to define the similarities and differences of the roles of stakeholders who are involved in ccTLD management. Also, to analyze ccTLD market orientation in order to define the difference outcomes resulted from different market orientations. Although, the outcomes of ccTLD market is limited to the number of registered website addresses ending with ccTLD.

IV. Findings

4.1 More State Controlled Multi-Stakeholder, Global ccTLD Markets, represented by .ch, (ccTLD of Switzerland)

SWITCH, the Swiss Education & Research Network is registered as administrative and technical contact for ccTLD .ch, which has ensured that it has been accessible from all over the globe, and the SWITCH allows users to register domains directly under. CH.

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4.1.1 The roles of the Swiss government in the ccTLD management

The government of Switzerland is represented by the Swiss Federal Office of Communications (OFCOM) as regulatory authority for second-level domain names under the domain ".ch". The legal provisions applied in particular to domain name under ccTLD .ch are, the Telecommunications Act of 30 April 1997, the Ordinance on Addressing Resources in the Telecommunications Sector of 6 October 1997, the OFCOM Technical and Administrative Regulations on the assignment and administration of second-level domain names below the ".ch" domain, the Data Protection Act of 19 June 1992 with the corresponding ordinance of 14 June, 1993.

4.1.2 The roles of the non-profit organization in the ccTLD management

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SWITCH itself is a non-profit organization with [an](#) education mission. It was formed in 1985 [when](#) the Swiss Federal Parliament initiated a program [to](#) provide, inter alia, for financial appropriation [of developing](#) tele-informatics services for education and research. [In the](#) business model of ccTLD .ch, the non-profit organization plays the main role, as registry.

4.1.3 The roles of private sector ~~in the ccTLD management~~

In 2003 SWITCH opened [a](#) partnership with the Internet Service Providers [to](#) private companies [who](#) register domain names directly for their customers-in their own name and for their own account. This means that a holder registering their domain name with a recognized partner of SWITCH uses only the customer service provided by this partner. The holder receives the invoice for services directly from the Partner. [There are](#) 63 (sixty three) ISPs registered as [partners of](#) SWITCH, and all of them are private companies⁹.

4.1.4 The readiness of the Internet community to respond to ccTLD market

According to statistic data of the Internet World Stats, the Internet penetration in Switzerland [was](#) 84.2 % [as of](#) Dec.31, 2011, [representing](#) 84.2% penetration, per ITU [of the](#) total population.¹⁰ Switzerland is known [to have](#) one of the highest Internet and broadband penetration rates in Europe, [and has](#) one of the highest broadband penetration rates in the OECD as well. [The](#) total number of registered domain names ending in .ch in 2013 is 1.752.794. The ratio between the registered domain names and the Internet penetration rate cannot be determined, because ccTLD .ch opens to global market, means registrants [are](#) accepted from all over the world.

⁹ Recognised Partners of SWITCH, available at <https://www.nic.ch/reg/cm/wcm-page/partnerlist/partnerlist.jsp?lid=en>

¹⁰ Internet World Stat, available at <http://www.internetworldstats.com/europa2.htm>

4.2 More State Controlled Multi-Stakeholder, National ccTLD Markets, represented by .au (ccTLD of Australia).

au Domain Administration Ltd (auDA) is registered as administrative and technical contacts in the ICANN for ccTLD .australia (.au). auDA is the policy authority and self-regulatory body for the .au domain space. The ccTLD .au is based on national market, [meaning](#) that it is open to use combining with the second level domain system (2LDs), which are, the open 2LDs (asn.au, com.au, id.au, net.au and org.au), the community geographic 2LDs (act.au, nsw.au, nt.au, qld.au, sa.au, tas.au, vic.au and wa.au), [and](#) the closed 2LDs (edu.au and gov.au). [The](#) domain name license [may](#) only be given to Australian citizens and Australian companies or other organizations [and](#) companies [legitimized](#) by Australian law.

4.2.1 The roles of the Australia government ~~in the ccTLD management~~

The Australian Government endorsed auDA to administer ccTLD .au and holds reserve powers [over](#) domain names under the *Telecommunications Act 1997*. The Commonwealth's [\(who is the Commonwealth?\)](#) endorsement of auDA as the appropriate entity to hold authority of the .au ccTLD is subject at all times to [the](#) auDA, operating within the provisions of its company constitution and to the fulfilment by auDA.

4.2.2 The roles of the non-profit organization ~~in the ccTLD management~~

The auDA itself is [a non-profit](#) organization, [with](#), the role [of](#) administrative and technical contacts in the ICANN for ccTLD .australia (.au). to develop and implement *domain name* policy, to license 2LD *registry* operators, to accredit and license *registrars*, to implement consumer safeguards, to facilitate .au Dispute Resolution Policy, and to represent .au at ICANN and other international forums.

4.2.3 The roles of private sector ~~in the ccTLD management~~

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auDA delegates the authority to manage .au to the registry through open tender processes every five years. From 2001 to 2014, the AusRegistry was appointed as registry .au. AusRegistry is a private company and doesn't provide services directly to the public. It delegates authority to serve and accept .au registration to thirty eight (38) Internet Service Providers (ISPs) as accredited registrars, which are categorized as private company as well. In ccTLD .au management, the private sector plays roles as registry and registrar.

4.2.4 The readiness of the Internet community to respond to ccTLD market

According to Internet World Statistics, in 2012 the Internet penetration in Australia was 88%, or 19,554,832 Internet users. The total number of registered domain names ending in .au in 2013 is 2,650,964. The ratio between the registered domain names and the Internet penetration rate is 13.5%.

4.3 Less State-controlled Multi-Stakeholder Global ccTLD Markets, represented by .mx (ccTLD of Mexico)

NIC-Mexico, ITESM - Campus Monterrey is registered at the ICANN as administrative and technical contacts for ccTLD .mx. Its functions include providing information services and registration .mx and the IP address allocation and maintenance of databases. In February 2009, ccTLD .mx was opened to global market, meaning that NIC-Mexico began to allow users to register domains directly under .MX.

4.3.1 The roles of the Mexico government in the ccTLD management

The government of Mexico isn't involve in the management of ccTLD .mx, even though all the regulations and policies related to the domain name registration and distribution of IP addresses are formed by NIC Mexico.

4.3.2 The roles of the non-profit organization in the ccTLD management

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The non-profit organization, which presented? by NIC Mexico has significant roles in management of ccTLD.mx. NIC Mexico not only has authority over the technical contact of .mx, but also to choose the registry and registrar for .mx, and to distribute the IP Addresses as well. NIC Mexico has three divisions: Registry .mx, Akky, and IAR Mexico. Registry .mx, is responsible for administering the territorial domain name .mx, and its main functions are to provide information services and registration for .mx domain names, and to maintain the respective databases. Registry.mx has delegated authority to Akky to process domain name registration and supply services related to the management of domain names.

4.3.3 The roles of private sector ~~in the ccTLD management~~

The private sector doesn't have roles in ccTLD .mx. Akky as registrar of .mx cannot count as private company, because they are one of division of NIC Mexico, which is based on non-profit organization. The unique of management ccTLD .mx is that it is opened to the global market, but the authority to sell .mx is limited to one national registrar, and it is not private company.

4.3.4 The readiness of the Internet community to respond to ccTLD market

According to the Internet World Stats, in 2011, the Internet penetration in Mexico is 36.5% or about 42.000.000 people out of 114.975.406 total population. Mexico has the highest numbers of the Internet users among countries in central America. Total number of registered domain names ending in .mx in 2013 is 654.562. The ratio between the registered domain names and the Internet penetration rate cannot be determined, because ccTLD .mx opens to global market, means registrants accepted from all over the world.

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4.4 Less State Controlled Multi-Stakeholder National ccTLD Markets, represented by .ca (ccTLD of Canada).

From 1987 to 2000 ccTLD. CA was assigned and registered by Computing Facilities Manager for the Department of Computer Science at the University of British Columbia (UBC) to provide the technical and administrative resources to house and operate the registry. Then the Canadian Domain Name Consultative Committee (CDNCC) formed The Canadian Internet Registration Authority (CIRA) and delegated the authority as administrative and technical contacts for ccTLD.ca that was legitimated by laws and constitution. CIRA allows users to register domains directly under. CA, however it is only sold in national ccTLD market, means that the registrars and registrants must be Canadian citizens, residents, companies or other legal entities as defined by Canadian law and must be operating in Canada and have a physical presence in Canada (in the case of companies or legal entities) or be resident in Canada in the case of citizens.

4.4.1 The roles of the Canada government ~~in the ccTLD management~~

The government of Canada will have a permanent, non-voting, ex-officio position on the CIRA Board, in order to legitimate the regulation and policies of management of ccTLD .ca.

4.4.2 The roles of the non-profit organization ~~in the ccTLD management~~

There are two non-profit organizations play main roles in ccTLD .ca, which are Canadian Domain Name Consultative Committee (CDNCC) and The Canadian Internet Registration Authority (CIRA). The CDNCC is a regulator body for .ca, which is composed of representatives from CIRA, the Canadian Internet Society (CISOC), Canadian Association of Internet service, Providers (CAIP) and the Federal Government. The CIRA plays role as a not-for-profit registry for the .ca to provide professional registry services comparable to

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other major national and international registries, to develop and carry out other Internet-related registration activities as directed by the membership and approved by the Board.

4.4.3 The roles of private sector ~~in the ccTLD management~~

The private sector plays the roles as registering names in the .ca domain, completing registration of names in the .ca domain for registrants with the CIRA registry, and providing registration information update services for registrants. There are 104 certified registrars, or Internet Services Providers (ISPs).

4.4.4 The readiness of the Internet community to respond to ccTLD market

According to the Internet World Stats, in 2012 the Internet penetration in Canada was 83.0% or 28,469,069 people. Canada is noted as one of countries with the highest Internet penetration. In a recent study by Ipsos Reid tracking the number of hours citizens of eleven major countries spent online, Canadians spent twice the world's average, or 44 hours per month. The total number of registered domain names ending in .ca in 2013 is 2,066,571. The ratio between the registered domain names and the Internet penetration rate is 7.25%.

These findings can be seen in the table below:

Category		More State Controlled Multi- Stakeholder, Global ccTLD Markets	More State Controlled Multi- Stakeholder, National ccTLD Markets	Less State Controlled Multi- Stakeholder Global ccTLD Markets	Less State Controlled Multi- Stakeholder National ccTLD Markets
No	Questions	.ch	.au	.mx	.ca
1	The roles of the government	regulatory authority for second-level domain names under the domain ".ch".	endorsed auDA to administer ccTLD .au	The government of Mexico doesn't involve in the management of ccTLD .mx	a permanent, non-voting, ex-officio position on the CIRA Board
2	The roles of non-profit organization	registry	administrative and technical contacts. And mainly as regulator body of .au	administrative and technical contacts, registry, and registrar	Regulator body by Canadian Domain Name Consultative Committee (CDNCC). And

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	Category	More Controlled State Stakeholder, Global ccTLD Markets	More Controlled State Stakeholder, National ccTLD Markets	Less Controlled State Stakeholder, Global ccTLD Markets	Less Controlled State Stakeholder, National ccTLD Markets
No	Questions	.ch	.au	.mx	.ca
					The Canadian Internet Registration Authority (CIRA).
3	The roles of private sector	Registrars	Registry and registrars	None.	Registrars
4	The rate of Internet penetration and the number of registrants of ccTLD)	84.2% or 6,430,363 Internet users out of 7,639,961 total population	88%, or 19,554,832 Internet users out of 22,015,576 total population.	36.5% or 42,000,000 Internet users out of 114,975,406 total population	83.0% or 28,469,069 Internet out of 34,300,083 total population
	The numbers of registered names	1.752.794	2.650.964	654.562	2.066.571
	The ratio between Internet penetration and the number of registered domain name	Cannot be determine	13.5%	Cannot be determine	7.25%

This shows that *national* ccTLD market has [a higher percentage of?](#) registered names than *global* ccTLD market. The message to keep national sovereignty, and consolidate the disappearing national identity on the Internet delivered to the registrants successfully.[?](#) Moreover, the present requirement to make sure the registrants are under jurisdiction has given legitimate security for the registrants, instead of the cyber security itself.[?](#) ccTLD .au and .ca are sold by national ccTLD market liberalize[?](#), giving opportunities [to](#) individuals to have register domain names, [to](#) registrants to register [unlimited](#) domain names, and to allow direct access to its country codes.

Likewise, [national](#) ccTLD market liberalize[?](#), the globalized ccTLD markets do the same [in](#) legitimizing the usage of the ccTLD by controlling their markets with government regulations, requiring administrative contacts to be in their jurisdiction, or, [if](#) registrants do

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not live in the country, to provide an administrative address in that country, or that the name servers must be registered with SWITCH in advance, in order to legitimize the existence of data server under Switzerland law and constitution made by OFCOM (the Office of Communications). Meanwhile, registry .mx opens its registration to any individual or corporation without requirements. The policies of .mx aren't under any country's jurisdiction. Although, it doesn't make the numbers of registrants of .mx are higher than registrants of .ch,.au,.ca, reflecting the registrants' legitimate concern about security ?under jurisdictions of the country.

The government's intervention, or state power in ccTLD management, is important to give legitimate security under country jurisdiction, because ccTLDs are seen as part of national sovereignty. The government's power can be applied by many ways: (1) Closing direct access to its country codes and limit the registration of ccTLD to the domestic registrants, such as .au. (2) Opening direct access to its country codes, but limit the registration of ccTLD to the domestic registrants, such as .ca. (3) Opening direct access to its country codes (and?) the registration of ccTLD to registrants globally, but requiring administration and technical provisions to be legitized by law under country jurisdiction, such as .ch. Meanwhile, the initiative of NIC Mexico to open direct access to its country codes, to open the registration of ccTLD to registrants globally, and to not wrap up? .mx markets under country jurisdiction, is less secure and reduces registrants' interest from other countries as well. The number of registrants of .mx is the lowest among four ccTLDs.

V. Discussion

The government of Indonesia has started to improve revenue from ICT fields, one of which to get revenue through the ccTLD .id market. Indonesia has endorsed government

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Regulation Number 82 in 2012 concerning the accomplishment of system and electronic transaction, one of chapters regulate about ccTLD .id management, including the function, terms and conditions of registry, registrars, registrants, general terms and conditions of registration domain name, and the contribution of ccTLD market to increase revenue of the government of Indonesia.

The government regulation Number 82 in 2012, chapter VIII about domain name management reflects the authority of the government of Indonesia, especially [the](#) Ministry of Communication and Information Technology of Republic of Indonesia as regulator body of ccTLD .id. Some concerns relate with the pattern of management of ccTLD.id, are:

1. Clause 74 (1): Registry and registrars are government and/or [private](#). This means that the role as registry and registrar can be played by the government and/or [the private sector](#).
2. Clause 74 (2): The [private institutions](#) involved in ccTLD management [must](#) be based [in](#) Indonesia [and](#) under Indonesia jurisdiction.
3. Clause 74 (3): The registry and registrars [must be](#) appointed by the Minister of Communication and Information of [the](#) Republic of Indonesia.
4. Clause 75 (3): The registry's functions are limited to [giving](#) input [into](#) domain name policies, monitoring registrars, and [resolving](#) disputes [over](#) domain names.
5. Clause 76 (1): The registrar's function is limited to [serv](#)[ing](#) [-the](#) registration process
- [6.](#) Clause 81 (2): The registry and registrars [are](#) obligated to share income [with](#) the government.

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7. Clause 81 (3): The shared income will be counted as revenue of ICT, excluded taxes to the government.

Increasing of ICT revenue is needed to improve the Internet penetration and develop more ICT infrastructures in remote regions in Indonesia. According to the Internet World Stats, the Internet penetration in Indonesia is 22.1% or 55,000,000 people of the total 248,645,008 population. This low Internet penetration rate is mainly caused by low Internet literacy in Indonesia, as well as a high rate of digital divide. This digital divide refers to the gap of individuals, households, businesses and geographic areas at different socio-economic levels in their opportunity to access information and communications technologies (ICTs). The main factor of digital divide is the inequality of ICT infrastructures among regions in Indonesia. Still, telecommunication and Internet Service Providers (ISPs) have been reluctant to expand to remote regions in Indonesia, and the government of Indonesia lacks funding to develop ICT infrastructures equally in all Indonesian regions.

VI. Policy Recommendation

The string .id is a potential name that has trademark not only as “.Indonesia”, but also as “.identity”. However, Internet penetration in Indonesia is still low, so ccTLD.id market cannot be counted to the national market. Therefore, the steps recommended to improve the ccTLD .id market are:

1. Legitimize PANDI as registry of ccTLD. ID by Minister’s regulation (Ministry Communication and Information Technology of Republic of Indonesia).

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2. [Process](#) re-delegation of ccTLD .id at the ICANN, [registering](#) PANDI as administrative and technical contacts of ccTLD .id, and Ministry Communication and Information Technology of Republic of Indonesia as sponsoring organization.
3. [Change](#) the national ccTLD regime model to become “More state,[?](#) More State-[c](#)ontrolled Multi-Stakeholder, Global ccTLD Markets”, [or](#) [opening](#) direct access to the country code .id, and [selling](#) it to the global market. [Registrants](#) should be allowed to use .id directly without certain 2LDs, and the opportunity to be registrant of .id should be opened [to](#) those who live in abroad.
4. [Ensure that](#) the servers data used exist in Indonesia regions and/or are under Indonesia Jurisdiction, [in order to maintain cyber security of ccTLD .id usage.;](#)

In conclusion, the increasing of the government’s roles in domain name management has been seen as legitimate security, which is more important than cyber security technically. Moreover, the ccTLD .id is seen as one of national resources that [could](#) contribute to [Indonesia’s](#) revenue, by opening direct access to the country code .id, and selling it to the global market. The increase [in](#) the number of registered domain names ending with .id, [through shared profits with the registry and registrars,](#) will increase [Indonesia’s](#) revenue

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